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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,507	12/14/2001	Naoki Tsukiji	214144US8	3570
22850	7590	10/19/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			SCHILLINGER, LAURA M	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/014,507	TSUKIJI ET AL.	
	Examiner	Art Unit	
	Laura M Schillinger	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16, 40 and 41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-9, 11-16, 40 and 41 is/are rejected.
- 7) ☒ Claim(s) 4 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 4 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 7-9, 13-14 and 16 rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto ('685).

In reference to claim 1, Yamamoto et al teaches a method comprising:

Forming a plurality of semiconductor elements (19) on a wafer (11) such that two adjacent elements define a separation boundary (23) (Fig.2b); and

Providing an integral semiconductor structure (16) across the separation boundary (23) such that the structure is common to the two elements formed on the wafer (Fig.2c)

Physically separating (cleaving) the two adjacent semiconductor elements approximately at the separation boundary (striped grooves) to form discrete semiconductor elements each having a portion of the integral semiconductor structure (Fig.2e and Col.6, lines: 20-30).

In reference to claim 2, Yamamoto et al teaches wherein the forming a plurality of elements comprises forming a plurality of semiconductor laser elements such that two adjacent laser elements define a separation boundary (Col.6, lines: 20-30).

In reference to claim 3, Yamamoto et al teaches wherein the forming the plurality of laser elements on the wafer such that the separation boundary is a light emitting facet for each of the two laser elements (Col.5, lines: 30-35 and Col.1, lines: 15-25).

In reference to claim 7, Yamamoto et al teaches wherein the physical separation comprises cleaving the two elements at the separation boundary (Col.6, lines: 20-30).

In reference to claim 8, Yamamoto et al teaches further comprising forming a reflective coating on a cleavage plane of a discrete element formed by cleaving (Col.6, lines: 15-20).

In reference to claim 9, Yamamoto et al teaches wherein forming a plurality of laser elements comprises forming elements on the wafer such that the separation boundary is a light reflecting facet for each of the laser elements (Col.5, lines: 30-35 and Col.1, lines: 15-25 and Col.6, lines: 15-20).

In reference to claim 13, Yamamoto et al teaches wherein the physical separation comprises cleaving the two adjacent laser elements at the separation boundary (Fig.2e and Col.6, lines: 20-30).

In reference to claim 14, Yamamoto et al teaches further comprising forming a reflective coating on the cleavage plane of a discrete laser element formed by the cleaving (Col.6, lines: 15-20).

In reference to claim 16, Yamamoto et al teaches wherein the physical separation comprises cleaving the two adjacent elements at the separation boundary (Col.6, lines: 15-20).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-6,11-12, 15, 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al ('685) in further view of Takano ('919).

In reference to claims 5, 11, 15 and 41 Yamamoto teaches a method of forming and separating laser devices by forming a separation boundary and cleaving; however fails to teach wherein forming the diffraction grating comprises forming one of a DFB and a DBR.

However, Takano explains that there are different kinds of semiconductor lasers, and that the DFB laser shifts light to enable stable single longitudinal mode oscillation (Col. 1, lines: 25-35).

Therefore it would have been obvious at the time the invention was made to modify Yamamoto's teachings to include the separation of DFB lasers because as Takano teaches, a DFB laser is merely an specific type of semiconductor laser which achieves single mode oscillation (Col. 1, lines: 25-35).

Moreover, the same motivation to combine Yamamoto and Takano's teachings explained above applies to claim 41, which recites wherein said forming a plurality of semiconductor elements comprises forming a semiconductor element configured to emit a light that has a plurality of oscillation longitudinal modes in an oscillation wavelength spectrum. The same motivation to combine anticipates the language of claim 41, because as Takano explains a DFB laser is a laser with has a single-longitudinal mode oscillation (Col.1, lines: 25-35).

Lastly, the same motivation to combine Yamamoto and Takano's teachings explained above applies to claim 15, which recites wherein the providing the structure comprises forming one of a light modulator and a light resonator because Takano teaches that the DFB laser is a

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laser which shifts in phase, a shift in phase is a modulation (Col.1, lines: 25-35); therefore the formation of a light modulator is anticipated.

In reference to claim 6 and 12, Yamamoto teaches a method of forming and separating laser devices by forming a separation boundary and cleaving; however fails to teach wherein providing a structure further comprises forming a light waveguide.

However, Takano teaches to include an optical waveguide with a light-emitting element (Col.2, lines: 20-30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further include forming an optical waveguide in conjunction with the semiconductor laser taught by Yamamoto in order to form a surface emitting laser diode as taught by Takano (Col.4, lines: 5-10).

In reference to claim 40, Yamamoto teaches a method of forming and separating laser devices by forming a separation boundary and cleaving; however fails to teach wherein said providing an integral semiconductor structure comprises providing a partial diffraction grating.

However, Takano teaches to form partial diffraction gratings (Col.1, lines: 45-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yamamoto's teachings to further include forming a partial diffraction

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grating as taught by Takano because as Takano teaches the complex diffraction gratings allow different complex wavefront conversion functions (Col.1, lines: 45-55).

### ***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

In reference to claims 4 and 10, prior art fails to teach nor suggest forming a diffraction grating across the separation boundary such that the diffraction grating is common to the two laser elements formed on the wafer in combination with the elements recited in the independent claim; therefore claim 4 is considered to contain allowable subject matter.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-16 and 40-41 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
LMS



10/15/04